

PRINT SERVICE SYSTEM AND METHOD FOR PRINTING DESIGNATED  
ELECTRONIC DOCUMENT IN RESPONSE TO PRINT REQUEST

BACKGROUND OF THE INVENTION

5 Field of the Invention

The present invention relates to a print service system for providing print services at a print service shop having an output apparatus such as a printer, in response to a user request.

10 Related Background Art

When a user prints electronic image/document at a print service shop having an output apparatus such as a printer, the user supplies a storage medium storing electronic data or connects a user terminal such as a personal computer to the output apparatus, to print the electronic data stored in the storage medium or in the user terminal.

A user may connect a user terminal at an office or home to a print server via a network such as the ISDN network to transmit electronic image/document via the print server to a print service shop to print out the electronic data.

SUMMARY OF THE INVENTION

25 As compared to direct printing by connecting a user terminal to a printer at a print service shop, indirect printing via a print server requires an

additional communication fee for transmitting electronic document data from the user terminal to the server and to the print service shop.

If the charging system uses always both a printer  
5 use fee and a communication fee irrespective of service  
types, a user is required to make a settlement by  
paying both the fees, which is not convenient for the  
user to use the system.

The invention has been made to solve such  
10 conventional technical problems and aims to provide a  
print service system capable of improving user  
settlement convenience by setting a charging system  
depending upon each service type.

With a conventional print service system, a fee  
15 per one copy is discounted depending upon the number of  
output copies, or discounted to a member fee for a  
registered user.

With this system, the fee is discounted simply depending upon the number of output copies or to the member fee, irrespective of how many times a user uses a printer. Therefore, a user who frequently uses a printer has no merit.

The invention has been made to solve such conventional technical problems and aims to provide a print service system capable of dynamically determining a fee depending upon the past use records of a user to provide services specific to each user.

Fig. 1 is a diagram showing the outline structure of a first print service system according to an embodiment of the invention.

5            Fig. 2 is a diagram showing the outline structure  
of a second print service system according to an  
embodiment of the invention.

Fig. 3 is a diagram showing the outline structure of a third second print service system according to an embodiment of the invention.

Fig. 4 is a block diagram showing the functions of a print service server.

Fig. 5 is a block diagram showing the functions of a print service shop.

15            Fig. 6 is a diagram showing a print service  
sequence when a user terminal accesses a print service  
server.

Fig. 7 shows an example of a display window on a user terminal.

20            Fig. 8 is a diagram showing a print service sequence when a user terminal directly accesses a printer at a print service shop.

Fig. 9 is a flow chart illustrating the outline of a process of updating a user charge management attribute.

Fig. 10 is a diagram showing an example of the structure of log data including user use records.

Fig. 11 is a diagram showing an example of a service use record management table before being updated.

Fig. 12 is a diagram showing an example of a user  
5 charge management attribute reference table.

Fig. 13 is a diagram showing an example of a service use record management table after updated.

Fig. 14 shows an example of a display window on a user terminal.

10            Fig. 15 is a flow chart illustrating a royalty  
              updating process for a print service shop.

Fig. 16 is a diagram showing an example of the structure of log data including operation records at each print service shop.

15            Fig. 17 is a diagram showing an example of a  
printer use record management table for each print  
service shop before being updated.

Fig. 18 is a diagram showing an example of a contracted shop royalty reference table.

Fig. 19 is a diagram showing an example of a printer use record management table for each print service shop after updated.

Fig. 20 shows an example of a display window on a user terminal at a print service shop.

25            Fig. 21 is a flow chart illustrating the outline  
of a print service shop selection service process.

Fig. 22 is a diagram showing an example of a shop

information table.

Fig. 23 shows an example of a display window on a user terminal.

Fig. 24 shown an example of a display window on a user terminal showing the location of a shop on a map.

Fig. 25 is a flow chart illustrating the outline of a fee computation process.

Fig. 26 is a diagram showing an example of the structure of log data including user service use types.

Fig. 27 is a diagram showing an example of a service type standard unit fee.

Fig. 28 is a flow chart illustrating the outline of a settlement process.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Embodiments of the invention will be described with reference to the accompanying drawings.

(Outline Structure of Print Service System)

Figs. 1 to 3 are diagrams showing the outline structures of a print service system according to the embodiments.

Referring to Fig. 1, a print service server 100 is a personal computer (PC) or a Web server and manages the whole of print services. A user charge process and a service shop settlement process are managed as a general rule by the print service server 100.

A print service shop 101 has a printer 101a, a PC

connected to the printer 101a via a LAN, and the like.  
The print service shop 101 provides users with print  
services.

5 A user terminal 102 may be a PC at a user office  
or home. It is desired that the user terminal 102 is  
connectable to the Internet via a telephone line or  
ISDN line and has a Web browser for analyzing an HTML  
document and displaying it on a display screen. A user  
accesses the print service system by using the user  
10 terminal 102.

In this example, although the system has one user  
terminal 102 and one print service shop 101, it is  
obvious that the system is applicable to a plurality of  
users and shops.

15 If a plurality of print service servers 100 are  
set and a means for transferring data between servers  
is provided, the system performance can be improved and  
a system having higher reliability can be realized.

The operation type of each print service system  
20 shown in Figs. 1 to 3 will be described.

In the system shown in Fig. 1, the user terminal  
102, print service shop 101 and print service server  
100 are interconnected by the same network. More  
specifically, they are connected to the Internet and a  
25 user accesses the print service server 100 and  
instructs the print service server 100 to print a  
designated document at the print service shop 101. The

charge management is performed by the print service server 100.

In the system shown in Fig. 2, a mobile telephone is used as the user terminal 102 which is prevailing nowadays and has a function of a data terminal. The fundamental service type is similar to that of the system shown in Fig. 1. In this system, a user connects the user terminal 102 to a gateway server of a mobile telephone carrier via a mobile telephone network, and to the Internet via the gateway server. The gateway server can perform user verification, charge and the like.

In the system shown in Fig. 3, as a user terminal 102, a portable PC such as a so-called note type PC is used. A user directly connects the user terminal 102 to a system of the print service shop 101 via a Centronics cable or the like, and a printer 101a directly handles a print request from the user terminal 102. Also in this system, the charge management and the like for each user can be performed collectively at the print service server. In this case, the printer 101a or a PC connected to the printer 101a transfers charge information of each print request to the print service server 100.

In operating the system, an access means to the print service server 100 is installed basing upon mainly a general Internet protocol (HTTP or the like),

and security is ensured by using a general means typically an SSL (Secure Socket Layer).

A connection means between the print service shop 101 and user terminal 102 is installed by using general parallel or serial connection.

Fig. 4 is a functional block diagram of the print service server 100 of the embodiments.

The print service server 100 is mainly constituted of: a communication controller 401; an information provider 402; a job acceptor 403; a job distributor 404, a data converter 405; an operation manager 406; a result acceptor 407; a fee computer 408; and a settlement maker 409, as well as a data management apparatus group comprising a verification information unit 451; a contract information unit 452; a fee system unit 453; a log information unit 454; a job unit 455; a document information unit 456; a settlement information unit 457; and a shop information unit 458. The print service server 100 constitutes a print service management server.

The communication controller 401 performs a data communication process for the user terminal 102, print service shop 101 and the like. A user verification process and the like are performed by using data managed by the verification information unit 451.

The information provider 402 searches requested data from various data managed by the server 100 and



The job acceptor 403 accepts job data (mainly  
5 print request) from a user, the job data being managed  
by the job unit 455. The job acceptor 403 also accepts  
a document registration request from a user, data  
regarding the document registration request being  
managed by the document information unit 456.

The data converter 405 performs a conversion process of converting, when necessary, the data format of job data or the like so as to match the print process performance of the print service shop 101 to which the job data is distributed.

The result acceptor 407 accepts a result of a job executed at the print service shop, and in accordance with the result contents, updates the job management data in the job unit 455 and registers the log information in the log information unit 454.

The fee computer 408 computes a fee to be claimed to the job result in accordance with various charge conditions, settlement data being managed by the settlement information unit 457.

5       The settlement maker 409 performs a settlement process for a charge depending upon user use records, a pay settlement process and royalty settlement process for each print service shop, and the like.

10       The data management apparatus group operated and managed by the server will be described supplementarily. Each data management apparatus or unit is constituted of a storage unit such as HD.

15       The verification information unit 451 manages data to be managed under sufficient security, such as a password and a settlement account number corresponding to a user ID. For a user whose access is to be denied, such as a user without a contract period updating process and a user whose fee is not paid even after the due date, an attribute representative of an access  
20       denied user is also managed by the verification information unit 451.

25       The contract information unit 452 manages data including each contracted user attribute (user name, address, contact location or the like), contract contents (contract period), settlement means (credit card, bank transfer, or the like), discount rate depending upon use records and the like.

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The fee system unit 453 manages a standard fee table for each service, a user charge management attribute reference table which is used as a calculation reference to various charge process services depending upon use records, a contracted shop royalty reference table which is used as a reference to royalty calculation of each contracted shop depending upon service records, and other tables.

The log information unit 454 sequentially records and manages as to who issued a job to which shop and what was the result, and the like, respectively of each service.

The job unit 455 manages a job received from a user to sequentially perform a job process. The job unit 455 stores a priority degree of each job to perform job scheduling, accepts a job with a designated execution time, and stores job data to be later executed again.

The document information unit 456 can perform registration, management, search and the like of a document upon request from a user.

The settlement information unit 457 manages data for settlement of service execution including a settlement process state.

The shop information unit 458 manages various shop information.

Fig. 5 is a functional block diagram of a shop

system constituted of a printer 101a and PC installed at a print service shop of the embodiments.

5 A print service shop system 101 is mainly constituted of: a communication controller 501; an information provider 502; a job acceptor 503; a job processor 504; a data converter 505; an operation manager 506; a result informer 507; a fee collector 508; and a printer 509, as well as a verification information unit 551; a contract information unit 552; 10 a fee system unit 553; a log information unit 554; a job unit 555; and a document information unit 556, respectively constituting a data management apparatus group. Each unit such as a PC including each constituent element excepting the printer 509 15 constitutes a shop service management unit.

The communication controller 501 performs a data communication process for the user terminal 102, print service server 100 and the like.

20 A user verification process and the like are performed also by the communication controller 501 when a user terminal is connected directly to the print service shop system 101. Data of a particular user having a high use frequency is transferred from the print service server to the verification information 25 unit 551 of this system so that the system can directly perform the verification process by using the transferred data. However, in a usual case, the

verification process is performed by the print service server.

The information provider 502 searches requested data from various data managed by this system and  
5 generates data to be sent back to the requester.

The job acceptor 503 accepts job data (mainly print request) directly from a user or from the print service server, the job data being managed by the job unit 555.

10 The job acceptor 503 also accepts a request for registering a document registration in this system from a user, data regarding the document registration request being managed by the document information unit 556.

15 The job distributor 504 sequentially transfers job data still not processed and under management by the job unit 555 to the printer 509 to execute the job, and in accordance with the job execution result, the job management data in the job unit 555 is updated and  
20 registered in the log information unit 554.

The data converter 505 performs a conversion process of converting, when necessary, the data format of job data or the like so as to match the print process performance of this system.

25 The operation manager 506 performs registration, update and the like of fee management data and the like necessary for providing and operating services for the

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print service server.

The log information unit 554 sequentially records and manages as to who issued a job to which shop and what was the result, and the like, respectively of the service supplied at the shop.

The job unit 555 manages a job received from a user to sequentially perform a job process.

The job unit 555 stores a priority degree of each job to perform job scheduling, accepts a job with a designated execution time, and stores job data to be later executed again.

The document information unit 556 can perform registration, management, search and the like of a document upon request from a user.

(Fundamental Process Flow of Print Service)

Fig. 6 is a diagram showing an example of a print service sequence according to the embodiment, and Fig. 7 shows an example of a display window on a user terminal.

Fig. 6 is a diagram showing the print service sequence when a user terminal 102 accesses the print service server 100 and asks the print service shop 101 for printing. The fundamental process flow will be described.

When the user terminal 102 issues a login request to the print service server 100 (S601), the server 100 performs a verification process (S602) and notifies an

access permission or inhibition.

Next, if a search request for a document stored in advance in the server 100 is issued (S603), the server 100 performs a requested document search process and  
5 notifies the search result (S604).

When a search request for available shop information is issued (S605), the server 100 performs a process of searching shop information from the shop information under management, in accordance with the  
10 requested search conditions, and notifies the search result (S606).

A user designates, if necessary, a document to be printed, a shop, print conditions supported by the print service shop, and the user terminal 102 transmits  
15 a print request to the print service server 100 (S607). The server 100 first confirms whether there is any problem of the user settlement status (S608), and then accepts the request (S609).

Fig. 7 shows an example of a display window on the user terminal. The user terminal 102 displays a search  
20 result list of documents registered in advance by the user in the print service server 100, and the user selects and identifies the document to be printed.

When a print requested job is distributed to a  
25 predetermined shop (S610), the shop 101 accepts the job (S611).

After the job is processed (S612), the job result



is notified to the server 101 (S613).

After the server 100 accepts the job result (S614), the server 100 executes a fee computation process (S615) to make settlement (S616), and the  
5 settlement data is registered in the log (S617).

Fig. 8 is a diagram showing a sequence when the user terminal 102 directly accesses the print service shop 101 and processes the print request in cooperation with the print service server 100. The fundamental  
10 process flow will be described. This sequence is applied, for example, to the case wherein a user with the user terminal 102 visits the service shop and connects the user terminal 102 to the printer 101a and PC of the print service shop.

15 When the user terminal 102 issues a login request to the print service shop system 101 (S801), the print service shop system 101 performs a verification process (S802) to notify a print permission or inhibition. In this case, the print service server 100 may be asked  
20 for the verification process if necessary (S803).

When the user terminal 102 issues a document print request by designating, if necessary, print conditions supported by the print service shop system 101 (S804), the shop system 101 confirms whether there is any  
25 problem of a user settlement status (S805), and then accepts the document print request (S807). At this time, the user terminal 102 transmits print data

(document data) to be printed as well as the document print request to the printer 101a. If necessary, the server 102 is asked for the settlement status to perform the confirmation process (S806).

5        If the document is registered beforehand in the print service shop system 101, the document is searched and designated to print it out.

10        After the job is processed (S808), the job result is notified to the server 100 (S809) which receives the job result (S810) and executes a fee computation process (S811) and then a settlement process (S812). The settlement data is registered in the log (S813). (Charge Management Attribute Update Process Depending Upon User Use Records)

15        Means for providing various services depending upon user use records will be described, which means is used for promoting use of services and is characteristic to the present invention. Fig. 9 is a flow chart illustrating the outline of a process of  
20        updating various user charge management attributes (such as a discount rate of a base fee) in accordance with user use records.

25        First, user use records are acquired from log data (S901). Fig. 10 shows an example of log data managed by the log information unit 454. Fig. 10 shows use records as of March 2000, with a user ID, a date of use, and a fee.

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Fig. 11 shows a service use record management table before log data managed by the contract information unit 452 is acquired. Since the use records of March are not recorded in the table shown in Fig. 11, log data shown in Fig. 10 is the use records of March. Namely, a use fee of Okuda in March is 2,450 Yen and a use fee of Yamada in March is 12,100 Yen.

Next, a discount rate of a use fee is determined from the acquired data and the contents of the user charge management attribute reference table managed by the fee system unit 453 (S902).

A user having larger use records is provided with more discount services.

Fig. 12 shows an example of the user charge management attribute reference table managed by the fee system unit 453. In this example, the table is used for determining a base discount rate, a term of settlement, a credit accepted and the like from use records of the previous month. Use records may be managed in the unit of three months, half year or the like.

In the example of the log data shown in Fig. 10, a base discount rate of Okuda is 1 % and that of Yamada is 5 % according to the use records of March.

Similarly, the term of settlement of each user is determined (S903).

It is judged that a user having larger use records

In the example of the log data shown in Fig. 10, a  
5 settlement term of Okuda is one day and that of Yamada  
is seven days according to the use records of March.

It is judged that a user having larger use records  
10 has more credit. The user is set with a higher upper  
limit credit accepted and provided with service of  
reducing the number of settlement times.

Next, in accordance with the data such as fee and settlement conditions of each user determined as above, the data such as fee and settlement conditions of each user in the service use record management table managed by the contract information unit 452 is updated (S905).

25           When the data of each user is changed, this effect  
is notified to the user (S906). A notifying means may  
be any means. An example of a display window on the

user terminal 102 is shown in Fig. 14.

The series of processes described above may be performed periodically or automatically when the amount of use records reaches a predetermined amount, by setting the operation manager 506.

(Contracted Shop Royalty Update Process Depending Upon Use Records)

Next, means for providing service of reducing a royalty depending upon use records will be described, which means is used for expanding print service sites and promoting affiliation of print service shops.

Fig. 15 is a flow chart illustrating a process of updating a royalty of a contracted shop.

First, use records of the print service shop 101 are acquired from log data (S1501). Fig. 16 shows an example of log data managed by the log information unit 454. Fig. 16 shows use records as of March 2000, with a shop ID of a print service shop, a date of use, and an operation (use) fee. Fig. 17 shows a printer use record management table of each shop managed by the shop information unit 458. Data in the table of Fig. 17 is the data before log data is acquired. Total records of the shop having a shop ID "0001" is 158,000 Yen and its royalty is 4.5 %, and total records of the shop having a shop ID "0002" is 64,850 Yen and its royalty is 10.0 %.

Next, a royalty of a contracted shop is determined

from the acquired data and the contents of a contacted shop royalty reference table managed by the fee system unit (S1502).

More discount service of a royalty is provided to a shop having larger operation records. Fig. 18 is an example of the contracted shop royalty reference table.

The table is used for determining a royalty basing upon total records counted from the service start. Instead, the table is preferably changed to a table suitable for service operation, for example, the table may be determined from records of each year.

Total records of the shop ID "0001" are 485,470 Yen and those of the shop ID "0002" are 136,950 Yen according to the log data shown in Fig. 16. Therefore, the royalty is 4.5 % for both the shops.

Next, in accordance with the royalty data of each shop determined by the above processes, the royalty data of each shop managed by the shop information unit 458 is updated (S1503).

Fig. 19 shows an example of a printer use record management table updated in accordance with total records. Although the royalty of the shop ID "0001" remains 4.5 %, the royalty of the shop ID "0002" lowers from 10.0 % to 4.5 %.

When the printer use record management table of each print service shop is updated, this effect is notified to the shop (S1504). A notifying means may be

any means. An example of a display window on the management terminal such as PC of a shop is shown in Fig. 20.

5 The series of processes described above may be performed periodically or automatically when the amount of operation records of each shop reaches a predetermined amount, by setting the operation manager 454.

(Shop Select Process By User)

10 Means for accessing the print service server 100 by a user to search a print service shop 101 and select the shop will be described.

Fig. 21 is a flow chart illustrating a shop select service process.

15 First, shop search conditions are designated (S2101). The shop search conditions may be shop location information, shop current running status information, various discount information of each shop, or the like. The shop search conditions are not  
20 limited only to the above, but it is desired that the shop search conditions beneficial to a user are added depending upon the operation state.

Next, shop information matching the designated search conditions is acquired from the shop information  
25 registered in the print service server 100 (S2102). The shop information is updated at proper timings.

Fig. 22 shows an example of a shop information

table managed by the shop information unit 458. By using the shop information table formed in accordance with the search conditions, designated shop information is derived.

5 In this table, shop location information, time service information and the like are managed as shop information. Other information beneficial to a user may be added. Shop information is dynamic information. Namely, this information is inquired from the server  
10 100 to the shop 101 to notify the new information to a user.

Shop information is notified to the user (S2103). An example of a display window on the user terminal 102 is shown in Fig. 23. As shown in Fig. 24, the location  
15 of a designated shop may be displayed on a map. (Service Use Fee Computation Process)

Means for computing a service user fee of this embodiment will be described.

Fig. 25 is a flow chart illustrating a fee  
20 computation process.

First, a unit service fee of a service type used by a user is acquired from a service type standard unit fee table managed by the fee system unit 453 (S2501).

The service type used by the user is acquired from  
25 log data. Fig. 26 shows an example of the structure of log data managed by the log information unit 454. Since data of the service type used by a user, such as

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direct and remote, is registered as the log data, it is possible to judge the service type used by the user from this log data. The log information unit 454 constitutes a print service request type management means. The fee computer 408 for executing the following computation process constitutes a print service request type judging means and a print service use fee computing means.

An example of the service type standard unit fee table is shown in Fig. 27.

The following description will be given by taking as an example a use fee of Okuda on April 1, 2000 shown in Fig. 26. Okuda printed a monochromatic copy of A4 size in a direct service request mode. A standard fee per one A4 sheet is 9 Yen as shown in Fig. 27. The service type standard unit fee table corresponds to the user fee computation table and the fee system unit 453 constitutes a user fee computation table management means.

Next, a fee corresponding to a use amount (number of printed sheets or the like) is calculated from the acquired unit fee (S2502).

In the example shown in Fig. 26, Okuda printed out ten sheets so that  $9 \times 10 = 90$  Yen.

Next, a discount rate managed by the contract information unit 452 for each user is acquired and a fee after discount is calculated from the obtained

standard fee (S2503).

From the service use record management table shown in Fig. 12, the discount rate applied to Okuda is 1 % so that  $90 \times 0.99 = 89.1$  Yen.

5       Next, if a discount service at the shop can be applied, a predetermined discount rate is acquired from the shop information unit 458 to calculate again the fee (S2504).

10       It is assumed in the above example that Okuda used the shop having the shop ID "0001". Since the use time is the midnight, the discount rate is 30 % as shown in the shop discount column of Fig. 22. Therefore, the fee calculated again is  $89.1 \text{ Yen} \times 0.7 = 62.37 \text{ Yen}$  which is rounded off to obtain a final fee of 63 Yen.

15       The discount rate in the shop discount column of the shop information shown in Fig. 22 varies with the operation status of the printer at each shop and with operation records at each shop.

20       The discounted fee at each shop is automatically claimed to the shop in another process.

The calculated data is managed as settlement data of each user and settlement is made in another process (S2505).

25       The result of the above-described processes is registered in the log (S2506). The registered log can be managed as service records.

In the above example, two types of service modes

are prepared including a direct service request mode from the shop system and a remote service request via the print service server. In each mode, a standard fee and the like for a monochromatic print and a color print of each recording sheet size are set and managed. Instead, the unit service fee may be set and managed flexibly. The remote print fee is higher than the other service because it contains a communication fee. (Settlement Related Process)

A settlement related process by the settlement maker 409 will be described.

Fig. 28 is a flow chart illustrating a settlement process.

When a settlement status confirmation request is received (S2801), a settlement status of the user, particularly, presence/absence of arrears, unsettled amount and the like, managed by the settlement information unit 457 are acquired and notified to the requester (S2802).

When a settlement process request is received (S2803), settlement data is received and managed by the settlement information unit 457 (S2804).

When a settlement process request of each user is received (S2805), a settlement day, a credit accepted and the like of each user managed by the contract information unit 452 are checked and a process corresponding to a preregistered settlement means

(credit card, bank transfer or the like) is executed (S2806). This settlement process request is called periodically from the operation manager 406.

When a settlement process request of each shop is received (S2807), by using information managed by the shop information unit 458, a settlement process based upon service records of each shop, a settlement process based upon royalty, a settlement process for user discount service and other processes are executed (S2808). This request is periodically called from the operation manager 406.

The processes to be executed by the print service system of the invention have been described above. The user charge management attribute update process, royalty update process of each contracted shop, service use fee computation process, settlement related process are not always required to be executed by computers interconnected by a network, but they may be executed manually by using a managing means such as books.

As described so far, according to the invention, a user is provided with a credit accepted so that it is convenient for the user to use the print service system.

Furthermore, as described above, according to the invention, a use fee is set in accordance with user use records and a user routinely using the system can use service at a low fee, and a print service shop can have routine users reliably.